Curriculum Vitae

Personal information

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Professional career

2017-	Group Leader, Research Group for Implantable Microsystems, Faculty of Information Technology & Bionics, Pázmány Péter Catholic University (PPCU)
2016.	Co-founder of Neuromicrosystems Ltd.
2015-2020	Principal Investigator, Institute for Technical Physics & Material Science, Centre for Energy Research, Hungarian Academy of Sciences
2014-2015	Alexander von Humboldt Postdoctoral Fellow, Microsystem Materials Laboratory, Department of Microsystem Engineering (IMTEK), University of Freiburg, Germany (12 months)
2009 - 2014	Research Fellow, Research Centre for Natural Sciences, Hungarian Academy of Sciences

Education

2013.	PhD in Electrical Engineering, Thesis: „”Development and characterization of silicon microfluidic components and systems”, at Budapest University of Technology & Economics
2009.	Msc in Electrical Engineering, Thesis: “Development of silicon microfluidics by the combination of proton beam writing and porous silicon micromachining”, at Budapest University of Technology & Economics

Research Projects as Principal Investigator

2020-2024	Improving functionalities of microscale brain-machine interfaces using integrated upconverting nanoparticles, project ID: NKFIH FK 134403, approximate funding: 115 kEUR
2020-2022	Human translational neuroMEMS research aided by artificial intelligence, Thematic Excellence Program, 240 kEUR
2020-2021	Application of softening polymers to map cortical activity, project ID: 2019-2.1.11-TÉT-2019-00002, funding:

2019-2020 Human translational neuroMEMS research, Thematic Excellence Program TUDFO/51757-1/2019-ITM, 120 kEUR

2018-2021 In vivo characterization of multimodal microdevices for infrared neural stimulation, 2017_1.2.1-NKP-2017-00002, 300 kEUR

2017. Acquisition of process and characterization equipment for micro- and nanomachining, KTIA_NAP_13-2-2017-0008, 80 kEUR

2016-2020 Investigation of novel implant materials for high-resolution, multiparametric imaging of cortical activity, NKFIH 120143, 156 kEUR

2015-2017 Optical stimulation of hippocampus and deep brain regions using novel micro- and nanomachining approaches, National Brain Research Program, KTIA NAP B 13-2-2015-0004, 300 kEUR

2015-2018 Understanding the impact of nanostructuring to control neural cell - solid surface interactions at brain-machine interfaces, OTKA NN 116550 – senior researcher / co-PI, 93 kEUR

2013-2015 Development of MEMS based measurement system for testing pharmacons in freely moving rodents (industrial R&D project funded by Gedeon Richter Plc), 65 kEUR

Supervision of students

21 Master & Bachelor students; 4 PhD students

Teaching

Info-bionics Engineering Msc at PPCU: Applications of Neural Microsystems (course leader)

Editorial roles in international scientific journals

Open Engineering (de Gruyter), Editorial Board Member
Sensors (MDPI), Topic Editor
Frontiers in Neuroscience, Neuroprosthetics Section Editor

Regular reviewer for international journals

Sensors & Actuators A:Physical, Sensors & Actuators B:Chemical, Sensors (MDPI), Journal of Micromechanics & Microengineering , Scientific Reports, J Neural Engineering, Lab on a Chip, Nanoscale, Nature Communication

Awards

2013 Postdoctoral Fellowship, Hungarian Academy of Sciences
2013 Prize of the Memorial Foundation of György Ferenczi
2014 Postdoctoral Fellowship of the Alexander von Humboldt Foundation, Germany
2015 Return Fellowship of the Alexander von Humboldt Foundation, Germany

2016 Reviewer of the Year at Journal of Micromechanics & Microengineering, IOP Pub.
2017 Outstanding Reviewer at Journal of Micromechanics & Microengineering, IOP Pub.
2018 János Bolyai Scholarship of the Hungarian Academy of Sciences
2019 New National Excellence Program Scholarship of the Ministry of Human Capacities
2019 Publication Award for Senior Scientists, PPCU
2020 New National Excellence Program Scholarship of the Ministry of Innov. & Techn.
2020 Reviewer of the Year, Journal of Neural Engineering, IOP Pub.
2021 New National Excellence Program Scholarship of the Ministry of Innov. & Techn.

Scientometrics

Number peer-reviewed scientific articles: 34 (20 as first/corresponding author)
Cumulative impact factor: 119.341
Number of independent citations: 351

List of publications in peer-reviewed international journals (34)

Z. Fekete, Á. C. Horváth, A. Zátonyi, Infrared neuromodulation: a neuroengineering perspective, JOURNAL OF NEURAL ENGINEERING (2020) in press, IF: 4.141

B. Csernyus, Á. Szabó, A. Zátonyi, R. Hodován, Cs. Lázár, Z. Fekete, L. Erőss, A. Pongrácz, Recent antiepileptic and neuroprotective approaches of brain cooling, SEIZURE: EUROPEAN JOURNAL OF EPILEPSY 82 (2020) 80-90, IF: 2.522

Á. C. Horváth, Ö. C. Boros, L. Komáromi, S. Borbély, P. Koppa, P. Barthó, Z. Fekete, Infrared neural stimulation and inhibition using an implantable silicon photonic microdevice, MICROSYSTEMS & NANOENGINEERING 6 (2020) 44, IF: 5.048

A. Zátonyi, M. Madarász, Á. Szabó, T. Lőrincz, R. Hodován, B. Rózsa, Z. Fekete, Transparent, low-autofluorescence microECoG device for simultaneous Ca2+ imaging and cortical electrophysiology in vivo, JOURNAL OF NEURAL ENGINEERING 17 (2020) 016062, IF: 4.141

M. Csernai, S. Borbély, K. Kocsis, D. Burka, Z. Fekete, V. Balogh, S Káli, Z Emri, P. Barthó, Dynamics of sleep oscillations is coupled to brain temperature on multiple scales, THE JOURNAL OF NEUROPHYSIOLOGY 597 (2019) 4069-4086, IF: 4.547

H. Liliom, P. Lajer, Zs. Bérces, B. Csernyus, Á. Szabó, D. Pinke, P. Lőw, Z. Fekete, A. Pongrácz, K. Schlett, Comparing the effects of uncoated nanostructured surfaces on primary neurons and astrocytes, JOURNAL OF BIOMEDICAL MATERIALS RESEARCH: PART A 107 (2019) 2350-2359, IF: 3.525

Ö. C. Boros, Á. C. Horváth, S. Beleznai, Ö. Sepsi, D. Csősz, Z. Fekete, P. Koppa, Optimization of an optrode microdevice for infrared neural stimulation APPLIED OPTICS 58 (2019) 3870-3876, IF: 1.973

F. Larramendy, S. Yoshida, D. Maier, Z. Fekete, S. Takeuchi, O. Paul, 3D arrays of microcages by two-photon lithography by spatial organization of living cells, LAB ON A CHIP 19 (2019) 875-884, IF: 6.774

A Zátonyi, G. Orbán, R. Modi, G. Márton, D. Meszéna, I. Ulbert, A. Pongrácz, M. Ecker, W.E. Voit, A. Joshi-Imre, Z. Fekete, A softening laminar electrode for recording single unit activity from the rat hippocampus, SCIENTIFIC REPORTS 9 (2019) 37237, IF: 3.998

Zs. Bérces, J. Pomothy, Á. Cs. Horváth, T. Kőhidi, É. Benyei, Z. Fekete, E. Madarász, A. Pongrácz, Effect of nanostructures on anchoring stem cell-derived neural tissue to artificial surfaces, JOURNAL OF NEURAL ENGINEERING 15 (2018) 056030, IF: 4.551

Ö.C. Boros, Á.C. Horváth, S. Beleznai, Ö. Sepsi, S. Lenk, Z. Fekete, P. Koppa, Optical and thermal modeling of an optrode microdevice for infrared neural stimulation, APPLIED OPTICS 57 (2018) 6952-6957, IF: 1.973

A. Zátonyi, F. Fedor, Zs. Borhegyi, Z. Fekete, In vitro and in vivo stability of black-platinum coatings on flexible, polymer microECoG arrays, JOURNAL OF NEURAL ENGINEERING 15 (2018) 0453003, IF: 4.551

A. Zátonyi, Zs. Borhegyi, M. Srivastava, D. Cserpán, Z. Somogyvári, Z Kisvárday, Z. Fekete, Functional brain mapping using optical imaging of intrinsic signals and simultaneous high-resolution cortical electrophysiology with a flexible, transparent microelectrode array, SENSORS & ACTUATORS B-CHEMICAL 273 (2018) 519-526, IF: 6.393

Á. Cs. Horváth, Ö. Cs. Boros, Sz. Beleznai, Ö. Sepsi, P. Koppa, Z. Fekete, A multimodal microtool for spatially controlled infrared neural stimulationin the deep brain tissue, SENSORS & ACTUATORS B-CHEMICAL 263 (2018) 77-86, IF: 6.393

Z. Fekete, M. Csernai, K. Kocsis, Á. Cs. Horváth, A. Pongrácz, P. Barthó, Simultaneous in vivo recording of local brain temperature and electrophysiological signals with a novel neural probe, JOURNAL OF NEURAL ENGINEERING 14 (2017) 034001, IF: 3.465

Z. Fekete, A. Pongrácz, Multifunctional soft implants to monitor and control neural activity in the central and peripheral nervous system: a review, SENSORS & ACTUATORS B-CHEMICAL 243 (2017) 1214-1223, IF: 5.401

Zs. Bérces, K. Tóth, G. Márton, I. Pál, B. Kováts-Megyesi, Z. Fekete, I. Ulbert, A. Pongracz, Neurobiochemical changes in the vicinity of a nanostructured neural implant. SCIENTIFIC REPORTS 6 (2016) 35944, IF: 4.259

G Márton, P Baracskay, B Cseri, B Plósz, G Juhász, Z Fekete, A Pongrácz: A silicon-based microelectrode array with a microdrive for monitoring brainstem regions of freely moving rats, JOURNAL OF NEURAL ENGINEERING 13 (2016) 026025, 2016, IF: 3.465

Z. Fekete,. E. Pálfi, G. Márton, M. Handbauer, Zs. Bérces, I. Ulbert, A. Pongrácz, L. Négyessy, Combined in vivo recording of neural signals and iontophoretic injection of pathway tracers using a hollow silicon microelectrode, SENSORS & ACTUATORS B-CHEMICAL 236 (2016) 815-824, IF: 5.401

M Kiss, P Földesy, Z Fekete, Optimization of a Michigan-type silicon microprobe for infrared neural stimulation, SENSORS & ACTUATORS B: CHEMICAL 224 (2016) 676-682, IF: 5.401

Z Fekete, Recent advances in silicon-based neural microelectrodes and microsystems, SENSORS & ACTUATORS B: CHEMICAL 2015 (2015) 300-315, IF: 4.758

I Rajta, R Huszánk, ATT Szabó, GUL Nagy, S Szilasi, P Fürjes, E Holczer, Z Fekete, G Járvás, M Szigeti, L Hajba, J Bodnár, A Guttman, Tilted pillar array fabrication by the combination of proton beam writing and soft lithography for microfluidic cell capture: Part 1 Design and feasibility, ELECTROPHORESIS 37 (2015) 498-503, IF: 2.482

Z Fekete, A. Németh, G. Márton, I. Ulbert, A. Pongrácz, Experimental study on the mechanical interaction between silicon neural microprobes and rat dura mater during insertion, JOURNAL OF MATERIAL SCIENCE: MATERIALS SCIENCE IN MEDICINE 26 pp. 70 (2015) IF: 2.587

Z Fekete, Technology of ultralong deep brain fluidic microelectrodes combined with etching-before-grinding, MICROSYSTEM TECHNOLOGIES 21 (2015) 341-344, IF: 0.974

Fürjes P, Holczer EG, Tóth E, Iván K, Fekete Z, Bernier D, Dortu F, Giannone D, PDMS microfluidics developed for polymer based photonic biosensors, MICROSYSTEM TECHNOLOGIES 21:(3) pp. 581-590. (2015), IF: 0.974

G Márton, I Bakos, Z Fekete, I Ulbert, A Pongrácz, Durability of high surface area platinum deposits on microelectrode arrays for acute neural recordings, J MATER SCI MATER MED. 25 (2014) 931-940, IF: 2.587

Z. Fekete, Á Cs Horváth, Zs. Bérces, A. Pongrácz: Black poly-silicon: a nanostructured seed layer for sensor applications, SENSORS AND ACTUATORS A: PHYSICAL 216 (2014) 277-286, IF: 1.903

G Márton, Z Fekete, R Fiáth, P Baracskay, I Ulbert, G Juhász, G Battistig, A Pongrácz: In vivo measurements with robust silicon based multielectrode arrays with extreme shaft lengths, IEEE SENSORS JOURNAL 13:(9) (2013) 3262, IF: 1.8

Z Fekete, Z Hajnal, G Márton, P Fürjes, A Pongrácz: Fracture analysis of silicon microprobes designed for deep-brain stimulation, MICROELECTRONIC ENGINEERING 103 (2013) 160-166, IF: 1.338

A Pongrácz, Z Fekete, G Márton, Zs Bérces, I Ulbert, P Fürjes: Deep-brain silicon multielectrodes for simultaneous neural recording and drug delivery, SENSORS & ACTUATORS B-CHEMICAL 189 (2013) 97-105, IF: 3.840

Z Fekete, A Pongrácz, P Fürjes, G Battistig: Improved process flow for buried channel fabrication in silicon, MICROSYSTEM TECHNOLOGIES 18 (2012) 353-358, IF: 0.86

Z Fekete, P Nagy, G Huszka, F Tolner, A Pongrácz, P Fürjes: Performance characterization of micromachined particle separation system based on Zweifach-Fung effect, SENSORS AND ACTUATORS B-CHEMICAL 162 (2012) 89-94, IF: 3.535

Z Fekete, B Sinkovics, I Rajta, G A B Gál, P Fürjes, Characterization of the end-of-range geometric effects in complex 3D silicon micro-components formed by proton beam writing, JOURNAL OF MICROMECHANICS AND MICROENGINEERING 20: p. 064015. (2010), IF: 2.27

Rajta I, Szilasi SZ, Fürjes P, Fekete Z, Dücső Cs, Si micro-turbine by proton beam writing and porous silicon micromachining, NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION B-BEAM INTERACTIONS WITH MATERIALS AND ATOMS 267:(12-13) pp. 2292-2295. (2009), IF: 1.156